



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,693	03/30/2001	Joy Roberts	12015US05	8035

7590

07/25/2003

Robert W. Fieseler  
McAndrews, Held & Malloy, Ltd.  
34th Floor  
500 West Madison Street  
Chicago, IL 60661

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 07/25/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/822,693

Applicant(s)

ROBERTS ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 10.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_. 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1, 4, and newly added claims 5-19 (the new claims were numbered 4-18, but have been renumbered to 5-19). Claim 4 is newly rejected under 35 USC §112, second paragraph, as necessitated by amendment. Claims 1 and 4-19 are newly rejected under 35 USC §103, but the new rejection of claim 1 was not necessitated by amendment. Additionally, claims 1 and 4-19 are newly rejected under the doctrine of obviousness-type double patenting over Colbow et al (U.S. Patent 6,472,090) in view of Kawatsu. Accordingly, this action is non-final. The 35 USC §112, second paragraph rejection of claim 1 is withdrawn as it is believed that the phrase “a predetermined threshold value” is sufficiently definite in light of the specification.

### ***Terminal Disclaimer***

2. The terminal disclaimer filed on May 2, 2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,096,448 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Specification***

3. The abstract of the disclosure is objected to because it exceeds 150 words (~15 lines) in length. Correction is required. See MPEP § 608.01(b).

***Claim Objections***

4. Claim 19 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 19 recites the same subject matter recited in claim 18. Accordingly, claim 19 fails to further limit claim 18.

***Claim Rejections - 35 USC § 112***

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 depends from claim 2, which has been canceled. Accordingly, claim 4 is indefinite.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 4-8, 10-13, and 15-19 are rejected under 35 U.S.C. 103(a) as being obvious over Wilkinson et al (U.S. Patent 6,096,448) in view of Kawatsu (U.S. Patent 5,677,073).

Regarding claim 1, in column 7, lines 40-56, Wilkinson et al. disclose a method of operating a solid polymer electrolyte fuel cell apparatus comprising the steps of supplying an oxidant stream from an oxidant supply system to the cathode, supplying a fuel stream from a fuel supply system to the anode, and monitoring a temperature parameter indicative of the operating temperature of the fuel cell. The duration or frequency of anode fuel starvation may be adjusted responsive to the temperature parameter using a control system. Regarding claim 5, the reactant starving is intermittent (see col. 3, line 1). Regarding claims 6-8, the reactant starving may comprise intermittently interrupting the supply of fuel to the anode (see col. 3, lines 18-24). Regarding claims 10 and 11, the fuel cell is arranged in a stack of fuel cells and the fuel supply to each of the fuel cells is not simultaneously interrupted (see col. 3, lines 25-30). Regarding claims 4, 12, and 13, the fuel starving may comprise intermittently connecting a transient electrical load to draw power from the fuel cell (see col. 4, lines 23-36). Regarding claim 15, the fuel cell is arranged in a stack of fuel cells and the connection of the transient load to each fuel cell is not simultaneous (see col. 4, lines 37-40). Regarding claims 16 and 17, the fuel stream may be hydrogen or reformat (see col. 9, line 52). Furthermore, in column 1, lines 35-40, the reference teaches that fuel cells can operate on “substantially pure hydrogen gas” and “substantially pure oxygen.” Regarding claims 18 and 19, the fuel cell is one of a plurality of cells arranged in a stack and the reactant starving causes a voltage reversal to occur in at least one fuel cell (see claim 39).

Wilkinson et al. do not expressly teach starving at least a portion of one of the electrodes when the temperature parameter is below a predetermined threshold value, as recited in claim 1.

Kawatsu is directed to methods for detecting and reversing the poisoning of an anode electrocatalyst (see abstract). In column 8, line 7, the reference teaches that the anode temperature decreases on places with higher degrees of poisoning.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Kawatsu to modify the method of Wilkinson et al. to include the steps of monitoring a temperature and initiating corrective action (i.e., fuel starvation) when the temperature falls below a predetermined value. The disclosures of Wilkinson et al. and Kawatsu are both concerned with methods of reversing CO poisoning on fuel cell anodes. Therefore, the artisan would look to the patent of Kawatsu for the specific parameters (i.e., temperature) that correspond to electrocatalyst poisoning, and would be motivated to modify the method of Wilkinson et al. so as to result in a method that incorporates the relevant parameters.

Regarding claims 16 and 17, as noted above, Wilkinson et al. disclose that “substantially pure” hydrogen and oxygen are known as fuels in fuel cells. The artisan would be motivated to use such fuels in the embodiments of the reference so as to reduce the rate of anode and cathode catalyst poisoning and extend the life of the fuel cell. Accordingly, claims 16 and 17 would be rendered obvious by the disclosure of Wilkinson et al.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

8. Claims 1 and 4-19 are rejected under 35 U.S.C. 103(a) as being obvious over Colbow et al (U.S. Patent 6,472,090) in view of Kawatsu.

Regarding claim 1, in column 8, line 51 et seq., Colbow et al. disclose a method of operating a solid polymer electrolyte fuel cell apparatus comprising the steps of supplying an oxidant stream from an oxidant supply system to the cathode, supplying a fuel stream from a fuel supply system to the anode, and monitoring a temperature parameter indicative of the operating temperature of the fuel cell. The duration or frequency of reactant starvation may be adjusted responsive to the temperature parameter using a control system. Regarding claim 5, the reactant

starving is intermittent (see col. 3, line 25). Regarding claims 6, 7, and 9, the reactant starving may comprise intermittently interrupting the supply of oxidant to the cathode (see col. 3, lines 45-51). Regarding claim 8, the fuel supply to the anode may be interrupted at the same time the oxidant supply to the cathode is interrupted (see claims 11 and 12). Regarding claims 10 and 11, the fuel cell is arranged in a stack of fuel cells and the fuel supply to each of the fuel cells is not simultaneously interrupted (see col. 3, lines 52-58). Regarding claims 4, 12, and 13, the oxidant starving may comprise intermittently connecting a transient electrical load to draw power from the fuel cell (see col. 4, lines 40-52). Regarding claim 15, the fuel cell is arranged in a stack of fuel cells and the connection of the transient load to each fuel cell is not simultaneous (see col. 4, lines 52-56). Regarding claim 14, the rates of both reactants to both electrodes are not increased in response to the transient load (see col. 12, lines 48-63). Regarding claims 16 and 17, the fuel stream may be hydrogen or reformat (see col. 11, line 3). Furthermore, in column 1, lines 39-44, the reference teaches that fuel cells can operate on “substantially pure hydrogen gas” and “substantially pure oxygen.” Regarding claims 18 and 19, the fuel cell is one of a plurality of cells arranged in a stack and the reactant starving causes a voltage reversal to occur in at least one fuel cell (see claim 30).

Colbow et al. do not expressly teach starving at least a portion of one of the electrodes when the temperature parameter is below a predetermined threshold value, as recited in claim 1.

Kawatsu is directed to methods for detecting and reversing the poisoning of an anode electrocatalyst (see abstract). In column 8, line 7, the reference teaches that the anode temperature decreases on places with higher degrees of poisoning.



Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Kawatsu to modify the method of Colbow et al. to include the steps of monitoring a temperature and initiating corrective action (i.e., simultaneous fuel and oxidant starvation) when the temperature falls below a predetermined value. The disclosures of both Colbow et al. and Kawatsu are both concerned with methods of reversing CO poisoning on fuel cell anodes. Therefore, the artisan would look to the patent of Kawatsu for the specific parameters (i.e., temperature) that correspond to electrocatalyst poisoning, and would be motivated to modify the method of Colbow et al. so as to result in a method that incorporates the relevant parameters.

Regarding claims 16 and 17, as noted above, Colbow et al. disclose that “substantially pure” hydrogen and oxygen are known as fuels in fuel cells. The artisan would be motivated to use such fuels in the embodiments of the reference so as to reduce the rate of anode and cathode catalyst poisoning and extend the life of the fuel cell. Accordingly, claims 16 and 17 would be rendered obvious by the disclosure of Colbow et al.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference

Art Unit: 1746

under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

### ***Double Patenting***

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1 and 4-19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 6,472,090 (Colbow et al.) in view of Kawatsu (U.S. Patent 5,677,073). The differences between the claims of the

instant application and the claims of the Colbow et al. patent are the steps of monitoring of a temperature parameter indicative of the operating temperature of the fuel cell and starving at least a portion of one of the electrodes when the temperature parameter is below a predetermined threshold value (instant claim 1), and operating the fuel cell on substantially pure reactants which are essentially free of catalyst poisons (claims 16 and 17). However, Kawatsu is directed to methods for detecting and reversing the poisoning of an anode electrocatalyst (see abstract). In column 8, line 7, the reference teaches that the anode temperature decreases on places with higher degrees of poisoning. Therefore, the artisan would be motivated by the disclosure of Kawatsu to modify the method of the claims of Colbow et al. to include the steps of monitoring a temperature and initiating corrective action (i.e., simultaneous fuel and oxidant starvation) when the temperature falls below a predetermined value. The claims of Colbow et al. and the disclosure of Kawatsu are both concerned with methods of reversing CO poisoning on fuel cell anodes. Therefore, the artisan would look to the patent of Kawatsu for the specific parameters (i.e., temperature) that correspond to electrocatalyst poisoning, and would be motivated to modify the method of the claims of Colbow et al. so as to result in a method that incorporates the relevant parameters. Regarding claims 16 and 17, the artisan would be motivated to use pure fuels in the system defined by the claims of Colbow et al. so as to reduce the rate of catalyst poisoning and extend the life of the fuel cell. Accordingly, the subject matter of instant claims 16 and 17 is an obvious variation of the system defined by the Colbow et al. claims.

*Conclusion*

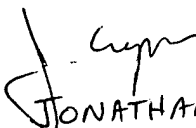
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

July 23, 2003

  
JONATHAN CREPEAU  
PATENT EXAMINER  
ART UNIT 1746